deformity ; but many specimens taken without other forms or variation preclude such conclusion. The species is more closely comparable with *P. guantanamensis* and *P. proboscidea* than with any other of the group ; but from these it is separable by the revolving sculpture and the up-tilted carina. It is the only carinated *Zachrysia* yet observed.

THE ANATOMICAL STRUCTURE OF GONIDEA ANGULATA (LEA).

BY A. E. ORTMANN.

The specimens at hand belong to the var. *haroldiana* Dall (Smithson. Misc. Coll. 50, 1908, p. 499; Hannibal, Proc. Malacol. Soc. London 10, 1912, p. 127, pl. 6, f. 10 ; Simpson, Descript. Cat. Nai., 1914, p. 466). They have been collected by H. Hannibal in Coyote Creek, Milpitas, Sta. Clara Co., California, partly on March 31, 1913, and partly in June, 1913. Over two dozen were received, among them males, sterile and gravid females.

Anal and *supraanal openings* separated by a well-developed mantle-connection, which is about $\frac{2}{3}$ as long as the anal, and about half as long as the supra-anal. Inner edge of anal with fine papillae. *Branchial opening* separated from the anal by the gill-diaphragm, its inner edge with large papillae ; branchial well defined anteriorly by the sudden disappearance of the papillae.

Palpi subfalciform, their posterior margins connected for about the half of their length.

Gills long and broad, the inner the broader. Outer gill gradually narrowing in front, its anterior end at the highest point of the line of attachment of the mantle, quite distant from the palpi. Inner gill narrowing more suddenly, and its anterior end about midway between palpi and anterior end of outer gill or at two thirds of this distance, but there is always a space behind the palpi. Outer lamina of outer gills entirely connected with mantle. Inner lamina of inner gills free from abdominal sac, except at its anterior end. Behind the foot, the two inner laminae of the inner gills are connected. Thus the gill-diaphragm is complete.

Gills with *well-developed septa*, running parallel to the gill filaments and forming water tubes. However, the septa are not all continuous, *but are often interrupted*, chiefly so toward the proximal (basal) part of the gill, and, toward the edge, frequently shorter septa are intercalated. In the female, *all four gills have marsupial structure*: the septa are much heavier and more closely set than in the male; this structure is most evident in the central parts of the gills, while at the anterior and posterior ends it resembles more that of the male. The heavy septa in the middle of the gills of the female are frequently *perforated by subcircular holes*, so that here the interruptions of the septa assume a rather regular arrangement.

When gravid, all four gills of the female are charged. The gills, when fully charged, are only slightly swollen, with edges remaining sharp, and often there are no ova at the ends of the gills, chiefly the anterior end. The outer gills are charged first, and thus there are some individuals in which the inner gills have *not yet* received ova. The ova only incompletely stick together in the shape of placentae, and easily fall apart.

Glochidia moderately large, subovate or nearly subcircular: they represent, in outline, a segment of a circle cut off by the hinge line; but the circle is not regular, being more narrowly rounded in the middle of the ventral margin. There is no trace of hooks. Valves of the glochidium rather strongly convex. Length and height about equal, 0.19 mm.

None of the gravid females collected on March 31 had glochidia, but such were present in some specimens collected in June. This, and the additional facts that in some females the gills were not yet fully charged in March, and that some were discharged in June, demonstrate that the beginning of the breeding season falls at the end of the month of March and that it lasts at least till June: a rather unusual time in North-American Nayades.

Color of soft parts grayish or brownish white, without any marked or characteristic tints.

This species originally was described as an *Anodonta*, and Simpson (1900 and 1914) placed it in his group of *Homogenae*, which largely (with the exception of the last three genera)

corresponds to my subfamily *Anodontinae* (Ortmannn, Naut. 23, 1920, p. 117 and Ann. Carn. Mus. 8, 1912, pp. 224 and 278). However, *it does not belong here at all.* It is true, the rudimentary condition of the hinge suggests its affinity with the *Anodontinae*, and what Simpson knew about the anatomy did not conflict with this. But the material at hand proves conclusively that none of the characters of the *Anodontinae* are present. It is, indeed, a member of the family *Unionidae* (as defined by myself l. c.), for it has a complete diaphragm formed only by the gills ; it has a supraanal opening ; the gills have septa and water tubes running parallel to the gill filaments. However, the facts, that all four gills are marsupial ; that the charged gills are only moderately swollen, with sharp edges ; that no system of secondary water canals is developed within the gills ; and that the glochidia are not triangular and have no hooks, *place Gonidea with the subfamily Unioninae.*

Within this subfamily, the genus has quite an isolated position, offering a curious mixture of primitive and advanced characters. The most primitive features are, that *all four gills are marsupial* in the female, and the *interrupted character of the septa.* This latter character is quite unique, suggesting even the ancient family of the *Margaritanidae.* The rather long mantle-connection between anal and supraanal openings does not agree with the more primitive types of the *Unioninae* (*Fusconaia* etc.), but rather with the more advanced ones (*Unio, Elliptio*), while the rudimentary condition of the hinge again is unique in the subfamily, exhibiting an advanced condition, which is not known, except in the genus *Lastena* (see Naut. 28, 1915, p. 106). The simple beak sculpture (4 to 5 subconcentric bars) appears as primitive. The glochidia are also of a primitive shape, agreeing with the shape generally found in *Unioninae.*

Hannibal (Science, 36, Dec. 20, 1912, p. 865) has suggested an amended division of the Nayades into families and subfamilies. I am not prepared to accept this as proposed, but I believe we shall be finally compelled, chiefly for the sake of convention, to follow his fundamental idea, namely that my subfamilies (*Unioninae, Anodontinae, Lampsilinae*) should rank as families. Then my *Unioninae* would become *Unionidae* (not

Quadrulinae, as Hannibal proposes, for I emphatically want to retain the European *Unio* in this group), and certain groups of my "*Unioninae*" should be elevated to the rank of subfamilies. Of the genera treated by myself in 1912 (l. c. p. 239, 240), eight (*Fusconaia* to *Uniomerus*) should form the subfamily *Quadrulinae*; the European *Unio* should form the subfamily *Unioninae*, and *Parreysia* and *Lamellidens* probably should form a third subfamily. In addition, another new subfamily should be erected for the present genus, that of the *Gonideinae*, with the characters of shell and soft parts as indicated above.

However, I refrain at present from working this out in detail, since there are yet many, chiefly exotic (Asiatic) genera, which require further study.

A NEW LANDSHELL FROM BRAZIL.

BY PAUL BARTSCH.

Among a lot of shells collected by Mr. H. M. Curran on the Rio Grungugy, Bahia, Brazil, is an *Oxychona* which differs from any of the described forms, and which I take pleasure in naming after the discoverer:

OXYCHONA PYRAMIDELLA CURRANI. New subspecies.

The shell strongly suggests *Oxychona pyramidella* (Wagner) described in his *Testacea Fluviatilia Brasiliana*, page 22, plate 16, figures 1 and 2, 1827, but differs from it by having the spire entirely white. The lip of our shell is of old-rose color while the broad basal band, which terminates a little before reaching the aperture, is liver-brown with a glaucous suffusion. The basal band is about one-third of the width of the base and is separated from the peripheral angle by a narrow white zone about one-fourth the width of the brown band. Our shell has seven whorls and measures: height 18.4 mm., greater diameter 22 mm., lesser diameter 18.6 mm.; the aperture measures from the columella to the outer angle of the keel 12.5 mm., from the columella to the posterior angle 6 mm. The type is Cat. No. 322281 U. S. N. M.